

As long as there were no machines
programming was no problem at all.

And now we have gigantic computers
programming has become an equally
gigantic problem.

E. W. Dijkstra

Mainly for people interested in.

Bits and pieces - and life,

and visits to museums.

Situation, late fifties

No tough customers or specifications
just: "write a program which can help me"

No competition

⇒ anything we did was a big
improvement over what did
not exist.

Resource bottle-necks:

Memory - bit hunting was a virtue

Tools

Methods, (no Knuth!)

DASK

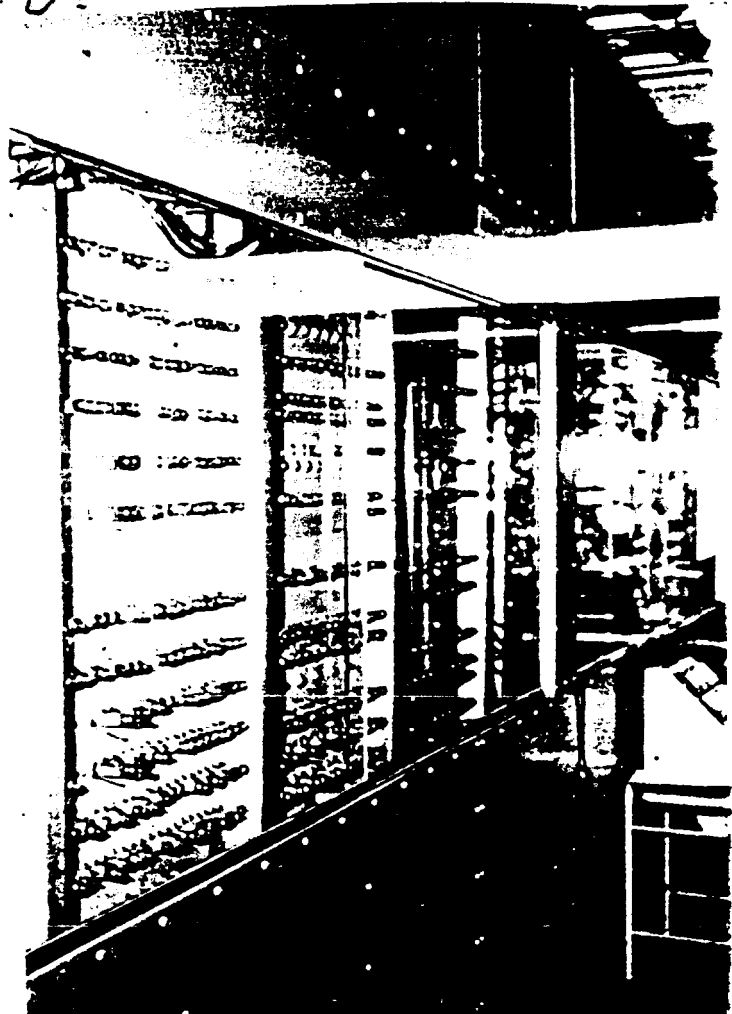
Valves

"Home made"

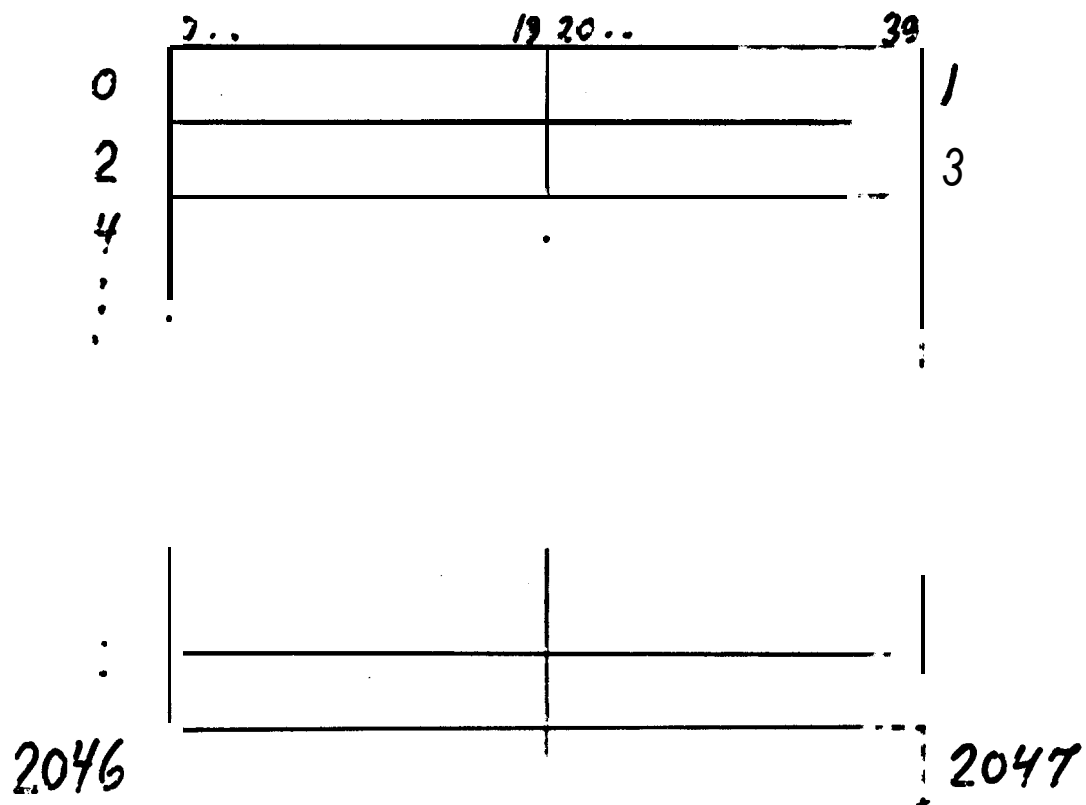
* Copenhagen 23th sep. 57
+ ? (70?)

Improved copy" of
RESK, Stockholm :
Index registers
subroutine call.

CPU:



DA Sk ,addressing:



Instructions : "halfword" = 20 bits

Operands : half or full word.

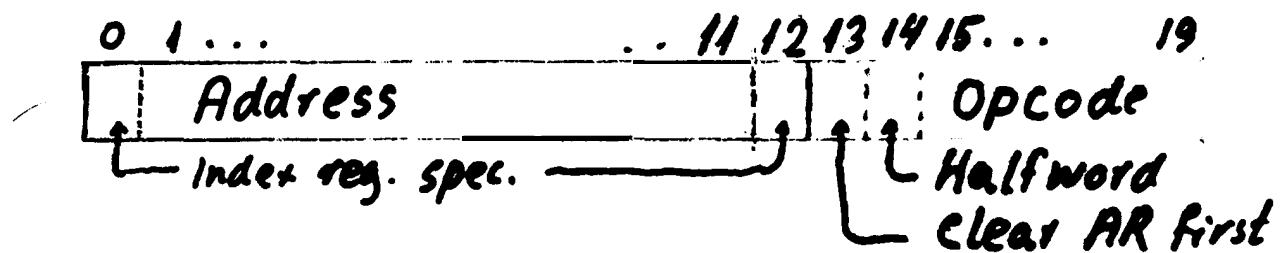
DA S K , CPU - architecture

- Small set of (specialised) registers:

AR: "accumulator" , 40 bits + AR00
MR: "multiplier" , 40 bits
IRB: index register B 12 bits
IRC: —"— C —"
IRD: —"— D —"
(IRA): —"— A always 0

(KR: internal, instruction counter, etc)

- Instruction format fixed = 20 bits
- General variant bits in instruction



- No indirect or relative addressing
- No floating point arithmetic

Speed: $7 \times 8 = 56 \text{ usec/instruction}$

DASK, input/output HW

Input: 4 (5) channel paper tape.

Output: IBM-typewriter (pre-golf-ball)
32 magnet activated keys

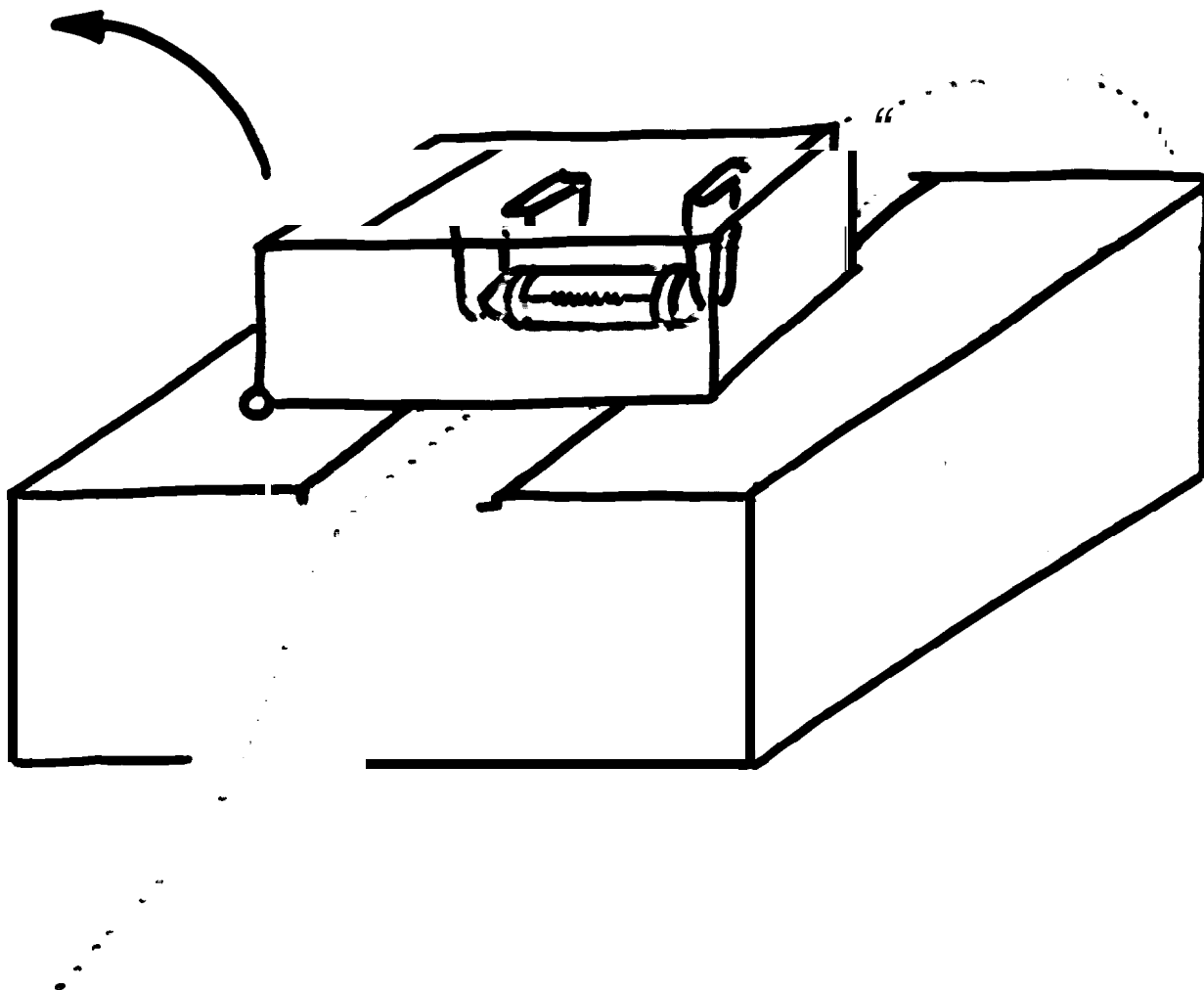
Paper tape punch

Later: 8 channel paper in, out?

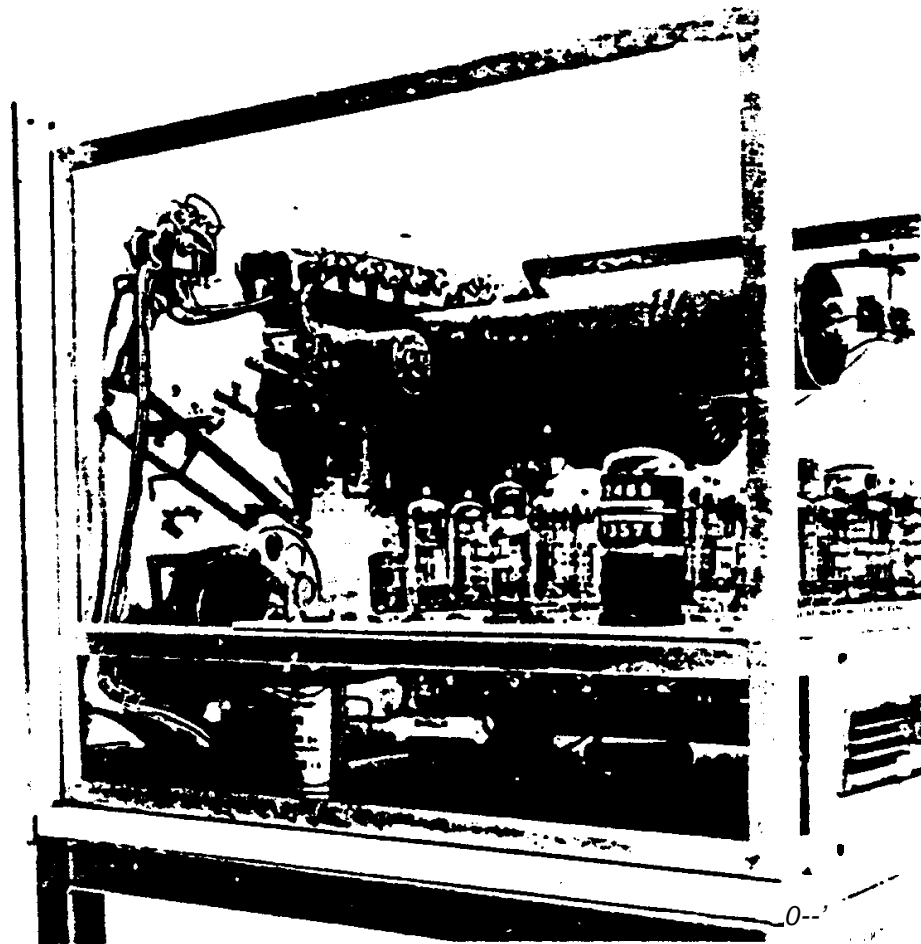
Printer

Magtape

Punched cards, out only



**ANTIQUE DANISH
PAPER TAPE READER
(LATE FIFTIES)**



*Dask's strimmellæser set bagfra. Det ser hjemmelavet ud
og var det også. Det store rør er lyskanonen med pære og
linser til den optiske læsning af strimlen.*

DASK better paper reader

DASK, input/output /-//d

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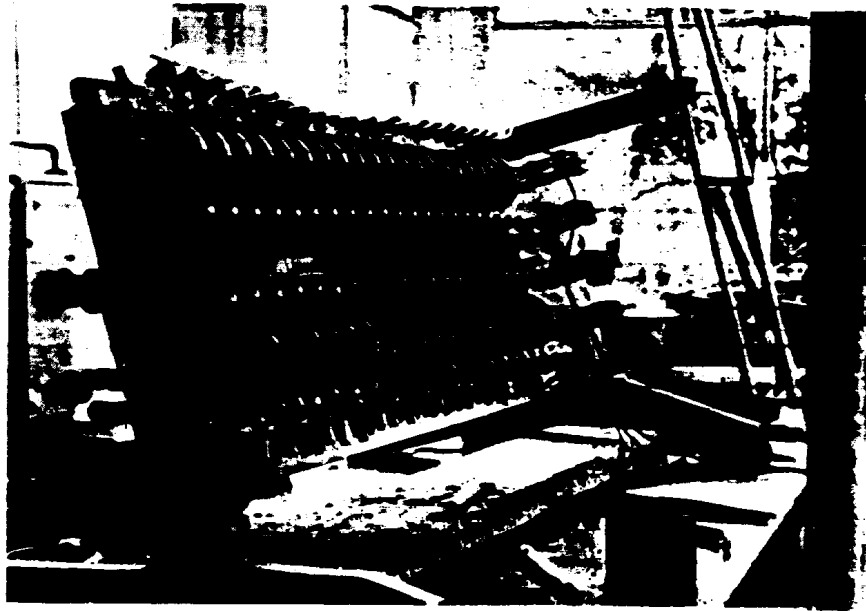
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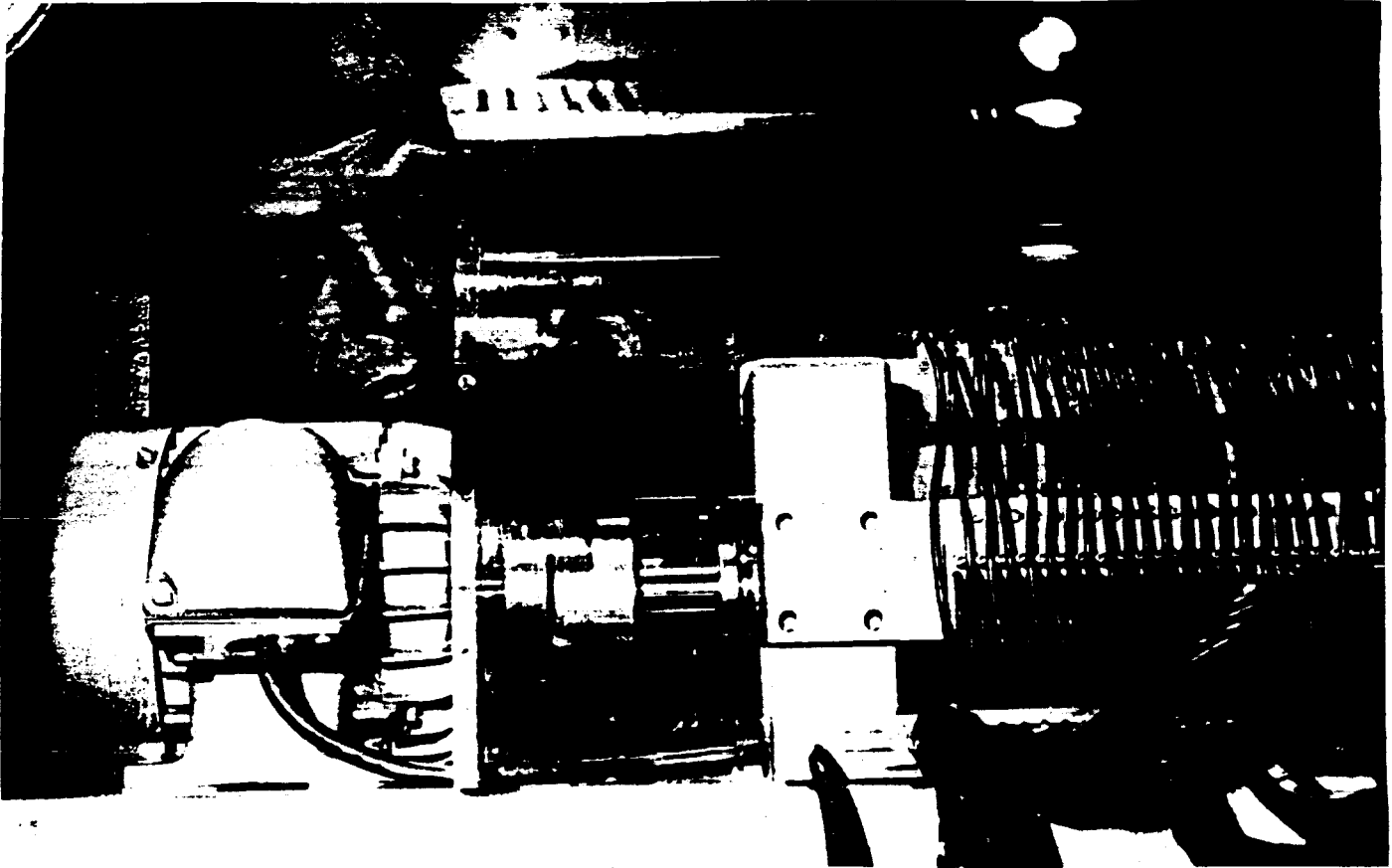
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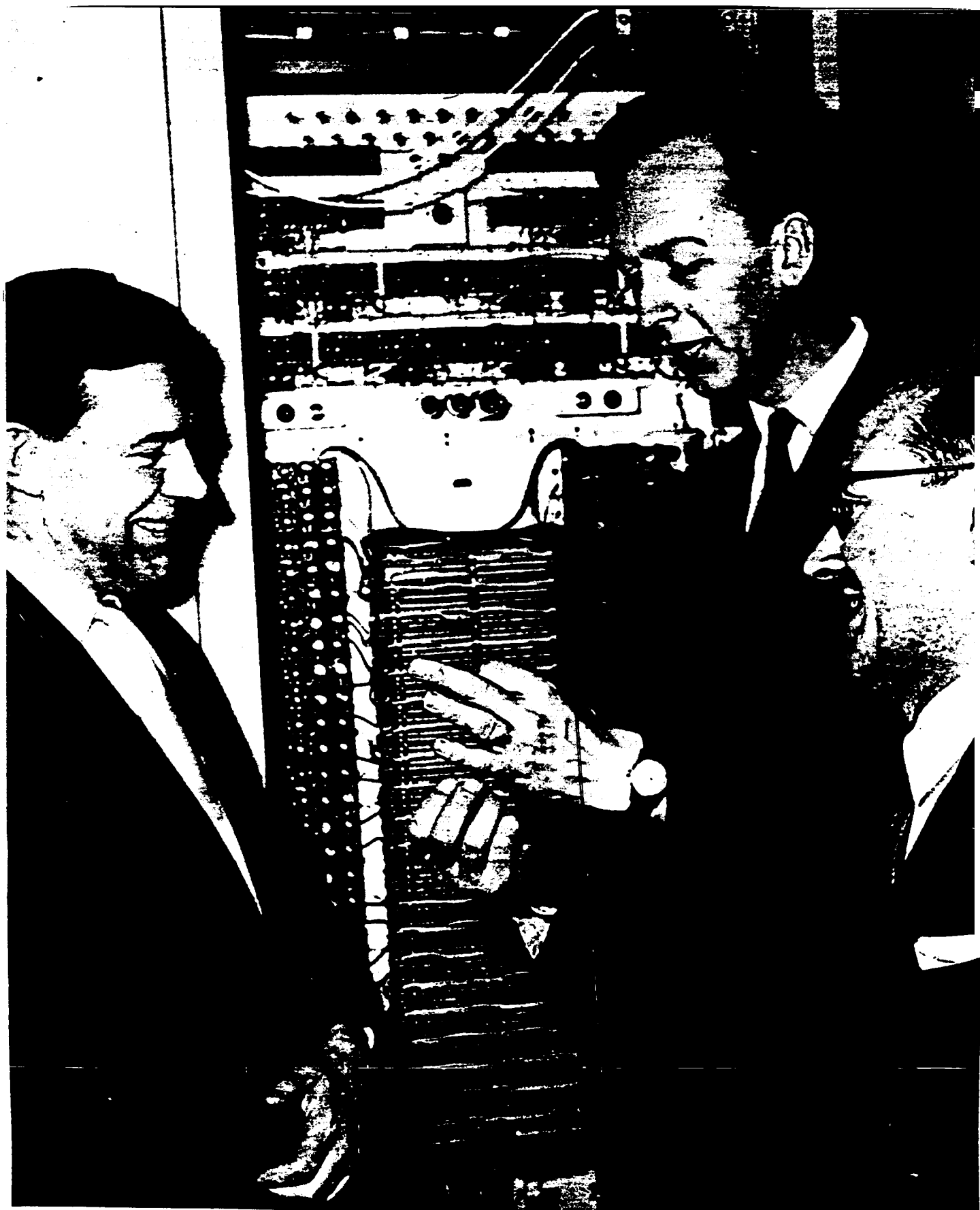


Holds: Algol run-time including
all predeclared standard procedures
(also input/output)
Floating point routines

...

Called with special subroutine call





DASK, input/output SW

Interrupt: ?? What is that ??

One instruction reads one character (5 bits) from a one-character buffer

Waits till done.

Footstrap:

One instruction reads 10×4 bits =
1 word = 2 instructions.

Key to do this to word 0.

Manual "Interrupt"

"Halt"

"Control:"

Instruction counter \rightarrow relays,

Jump to fixed location.

After a pause: relays \rightarrow AR, start

"Take operator input from AR
pushbuttons"

